information resources. Schools of today, like businesses of today, could hardly function without technology.

Technology in Support of Economic Development

Based on the Workforce Development Concept, the Columbus Public School District is committed to ensure that all students become successful, lifelong learners. It is difficult to imagine that this can be obtained without preparing students for the Information Age of the 21st century. Both instructional practice and supporting curricular and management systems must take advantage of the power of current emerging technologies. Learners will be able to interact successfully in a technological environment to achieve their personal, education and workplace goals. Columbus Public Schools views technology as an effective and necessary tool, capable of enhancing both the communication ability and productive capacity of our students, staff and parents. Columbus Public School students must be competitive in an ever-changing world. The opportunity to develop technological proficiency will enable students and staff to maximize their access to information, enhance problem-solving skills and develop effective communication in the Information Age.

Additional Benefits of Technology Infusion

Technology provides a path for the school district to shorten the distance between itself and the community it serves. Communication and understanding increase as the distance shortens.

1.4 Technology Mission Statement and Vision

Mission Statement

Columbus Public Schools is focused on the development, integration and support of technology that provides a foundation for excellence in academic achievement and highly efficient operations.

Vision

Technology infrastructure provides a critical foundational component to build our academic and operational programs.

Technology must be effectively integrated into the daily curriculum so that it expands the teaching capacity of every teacher and the learning capacity of every child.

Technology must be reliable, easy to use, and adaptable to the various needs of the classroom.

Technology must be effectively integrated into the office environment to support efficient operations.

Effectively implemented technology becomes nearly invisible to the user communities allowing them to focus on Academic goals.

1.5 Ongoing Stakeholder Communications

Tactical Communications Plan

Multiple approaches are planned for communication with stakeholders. The District recently developed an information delivery strategy using its Intranet. The Intranet strategy allows open communications without managing distribution lists which might accidentally exclude interested stakeholders.

Email, newsletters, and meetings will also continue to be used.

Appropriate and timely coordination with the District Communications Department is critical to the ongoing

success of technology efforts. Existing District internal and external communication channels will be utilized to distribute appropriate information.

Community Relations Strategy

To gain a broad spectrum of input and support, the District will use the means of community communications:

CURRENT EFFORTS

- Brochures for the county concerning technology implementation and evaluations.
- School based newsletters distributed to parents, students and community members.
- Press releases (Print and local)
- Participation of business advisory groups
- Board Meetings re-broadcast on community cable channels
- Providing information to and seeking input from other school districts, regional partnerships or consortium such as the Ohio SchoolNet, Tech Corps and the Central Ohio Education Council.
- Provide information on District's web page.
- In partnership with local PTA and City Year Columbus instructors offer basic computer skills training to the local community in our schools in the evenings.
- Participate in a "Back-to-School" Night
- Community members and parents as members of District's committees.
- Parent access to administrators and teachers by electronic mail.
- School based web pages
- Automated telephone calling to inform parents of student absentees and school related information.

FUTURE DIRECTION

- School based Internet web portals to display school additional information to parents and community members. Example: Student progress reports via the Internet.
- Community Learning Nights to provide members of the community access to technology related instruction and seminars.

1.6 Service Agencies, Partnerships, and Community Linkages

Potential Funding Resources

Careful planning and the use of existing and new funding sources will be necessary to ensure that the technology resources and training provided to district schools keeps pace with advancing and emerging technologies. Adequately funding technology for education is a process of identifying and securing funding from multiple sources. Such sources include, but are not limited to:

- Titles I & VI Funds
- Title II Funds (entitlement and competitive)
- Title VII Funds
- Technology Literacy Challenge Fund Grants
- Library Services and Technology Act (LSTA)Grants
- Ohio Consortium for Conceptual Learning (OCCL)Grants
- Ohio SchoolNet
- Job Training Partnership Act
- U.S. Department of Commerce NTIA
- Universal Service Fund – (E-Rate)
- Corporate Foundations
- Private Foundations

· DOE Allocated Teacher Training Funds

Current District Partnerships

The district has established cooperative efforts with the following groups and organizations.

· Public Libraries - CPS has developed an on-going partnership with Columbus Metropolitan Libraries. This partnership was created to provide the district with additional resources that students could not otherwise have access to.

· Higher Education Institutions - CPS has forged a partnership with Ohio State University and Ashland University. Partnering with this institution has allowed the district to design a curriculum that will use technologies in a relevant and benficial manner for students.

· Contracted Suppliers - Through competitive selection the District establishes partnerships with technology solution providors.

· Business Volunteers - Local businesses continue to provide representatives to committees, panels and reviews associated with technology.
· Columbus Urban League
· Instructional Technology Services of Central Ohio, Inc. (ITSCO)
· Cable in the Classroom
· Tech Corps
· Franklin County Education Council

Potential District Partnerships and Linkages

We are currently examining potential linkage and partnership with the local City government.

The Battelle For Kids foundation is another noted partnership opportunity.

Phase 2 - Assess Current Status of Educational Technology

2.1 Student and Staff Technology Skills, Knowledge, and Usage

District Technology Standards

Columbus Public Schools agrees with the basic standards set forth by the Ohio Technology Academic Content Standards for students and the International Society for Technology in Education (ISTE) for students, teachers, and administrators. The District will use a variety of methods to measure improvement in student achievement with the implementation of technology. Administrators will monitor student quantitative and qualitative assessment indicators to determine whether or not student performance has increased due to educational technology integration. The use of an integrated software programs within elementary schools will provide teachers and administration timely information for learning assessments and remediation training. Teachers and administration will use technology applications to monitor student achievement. The District shares the beliefs and assumptions outlined in the Ohio Commission on Educational Technology State Plan to Implement Technology to Support Student Learning. Listed below are the seven Ohio student Technology Academic Standards that the District supports. In the Documents Library of this Plan is a more complete overview of the student standards with appropriate benchmarks.

STANDARD 1. Nature of Technology - Students develop an understanding of technology, its scope, core concepts, characteristics, and relationships between technologies and other fields.

STANDARD 2. Technology and Social Interaction - Students recognize interactions among society, the environment and technology, and understand technology's relationship with history. Consideration of these concepts forms a foundation for engaging in responsible and ethical use of technology.

STANDARD 3. Technology for Productivity Applications – Students learn the operations of technology through the usage of technology and productivity tools.

STANDARD 4. Technology and Communication Applications – Students use an array of technologies and apply design concepts to communicate with multiple audiences, acquire and disseminate information, and enhance learning.

STANDARD 5. Technology and Information Literacy – Students engage in information literacy strategies; use the Internet, technology tools and resources; and apply information management skills to answer questions and expand knowledge.

STANDARD 6. Design – Students will apply a number of problem solving strategies demonstrating the nature of design, the role of engineering, and the role of assessment.

STANDARD 7. Design World – Students understand how the physical, informational, and bio-related technology systems of the designed world are brought about by the design process. Critical to this will be the students' understanding of their role in the designed world; its processes, products, standards, history, future, impact, issues, and career connections.

Student Technology Attitudes

Students are changing from passive learners to active participants in the learning environments. We are changing our curriculum focus from instructional objectives that guide learning to outcomes that are expected of students as they master the curriculum. Students today are charged with more responsibility for their own learning. They need to master curriculum principles and problem solving techniques. New learning

environments enhanced by technology emphasize personalized student educational plans, a greater degree of independent small group learning, and a more active learning environment. Technologies help students find and handle more information more quickly, build a more productive knowledge base, and learn more about the real world by engaging in real world simulations that aid in the process of developing logical problem-solving skills.

Student Technology Skills

The following are technology skills taught within the curriculum to increase student achievement.

Prior to completion of Grade 2:
1.Use input devices and output devices to successfully operate computers and other technologies for directed and independent learning activities.
2.Use developmentally appropriate multimedia resources to support learning.
3.Work cooperatively and collaboratively with peers, family members, and others when using technology in the classroom.
4.Use technology resources for problem solving, communication, and illustration of thoughts.

Prior to completion of Grade 5:
1.Use keyboards and other comrnon input and output devices, including adaptive devices when necessary, efficiently and effectively.
2.Discuss basic issues related to responsible use of technology and information and describe personal consequences of inappropriate use.
3.Use general purpose productivity tools and peripherals to support personal productivity, remediate skill deficits, and facilitate learning throughout the curriculum.
4.Use technology tools for individual and collaborative writing, communication, and publishing activities to create knowledge products for audiences inside and outside the classroom.
5.Use telecommunications and online to participate in collaborative problem-solving activities for the purpose of developing solutions or products for audiences inside and outside the classroom.
6.Determine which technology is useful and select the appropriate tool(s) and technology resources to address a variety of tasks and problems.
7.Evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources.

Prior to completion of Grade 8:
1.Apply strategies for identifying and solving routine hardware and software problems that occur during everyday use.
2.Exhibit legal and ethical behaviors when using information and technology, and discuss consequences of misuse.
3.Use content-specific tools, software, and simulations to support learning and research.
4.Apply productivity/multimedia tools and peripherals to support personal productivity, group collaboration, and learning throughout the curriculum.
5.Design, develop, publish, and present products using technology resources that demonstrate and communicate curriculum concepts to audiences inside and outside the classroom.
6.Collaborate with peers, experts, and others using telecommunications and collaborative tools to investigate curriculum-related problems, issues, and information, and to develop solutions or products for audiences inside and outside the classroom.
7.Research and evaluate the accuracy, relevance, appropriateness, comprehensiveness, and bias of electronic information sources concerning real-world problems.

Prior to completion of Grade 12:
1.Identify capabilities and limitations of contemporary and emerging technology resources and assess the potential of these systems and services to address personal, lifelong learning, and workplace needs.
2.Analyze advantages and disadvantages of widespread use and reliance on technology in the workplace and in society as a whole.
3.Demonstrate and advocate for legal and ethical behaviors among peers, family, and community regarding the use of technology and information.
4.Use technology tools and resources for managing and communicating personal/professional information.
6.Evaluate technology-based options, including distance and distributed education, for lifelong learning.
7.Select and apply technology tools for research, information analysis, problem-solving, and decision-making in content learning.
8.Investigate and apply expert systems, intelligent agents, and simulations in real-world situations.
9.Collaborate with peers, experts, and others to contribute to a content-related knowledge base by using technology to compile, synthesize, produce, and disseminate information, models, and other creative works.

Students Technology Usage

The curriculum our students will learn in school will be carefully developed and articulated PreK-12 to parallel the skills graduates need to be successful for the rest of their lives. It will include the content skills, and abilities identified as essential by national organizations, state requirements, and business recommendations.

The computer and media curriculums will be written emphasizing these major program outcomes throughout a student's educational career:

1. Being comfortable using a computer
2. Increasing Computer literacy
3. Enhancing basic input and data interpretation skills
4. Be able to use general computer applications (spread sheet, databases, word processing, desktop publishing, etc.)
5. Be able to use technical tools (scanner, modem, CD-ROM, etc.)
6. Be able to access, process, produce, and present information using a computer
7. Be able to adapt to technological change
8. Understand the importance of computers in the workplace
9. Be receptive to and able to adjust to future media hardware and software developments
10. Be able to analyze and interpret information.

In addition, the articulated PreK-12 technology/computers/media curriculum will be organized into course or grade level outcomes that will define exactly for students, parents, and teachers what students will need to know, and be able to do, in order to complete a course or grade.

Staff Technology Attitudes

Teachers demonstrate a sound understanding of technology operations and concepts. Teachers consistently demonstrate introductory knowledge, skills, and understanding of concepts related to technology (as described in the ISTE National Education Technology Standards for Students). In addition, a highly qualified staff also exhibits continual growth in technology knowledge and skills to stay abreast of current and emerging technologies.

The staff also understand the social, ethical, legal and human issues surrounding the use of technology in

PK-12 schools and apply those principles in practice. Teachers model and teach legal and ethical practice related to technology use, while also applying technology resources to enable and empower learners with diverse backgrounds, characteristics, and abilities. In addition, teachers:

- Identify and use technology resources that affirm diversity
- Promote safe and healthy use of technology resources.
- Facilitate equitable access to technology resources for all students.

Staff Technology Skills

Consistent throughout the District, staff employees demonstrate skills that can be used with all students in the classroom.

Teachers use their skills by:

- Demonstrating a sound understanding of technology operations and concepts.
- Planning and designing effective learning environments and experiences supported by technology.
- Implementing curriculum plans that include methods and strategies for applying technology to maximize student learning
- Applying technology to facilitate a variety of effective assessment and evaluation strategies.
- Using technology to enhance their productivity and professional practice.
- Understanding the social, ethical, legal and human issues surrounding the use of technology in PK-12 schools and apply those principles in practice.
- Designing developmentally appropriate learning opportunities that apply technology-enhanced instructional strategies to support the diverse needs of learners.
- Identifying and locating technology resources and evaluating them for accuracy and suitability.
- planning for the management of technology resources within the context of learning activities.
- Planning strategies to manage student learning in a technology-enhanced environment.

Administrators use their leadership skills by:

- Inspiring a shared vision for comprehensive integration of technology and fostering an environment and culture conducive to the realization of that vision.
- Ensuring that curricular design, instructional strategies, and learning environments integrate appropriate technologies to maximize learning and teaching.
- Applying technology to enhance their professional practice and to increase their own productivity and that of others.
- Ensuring the integration of technology to support productive systems for learning and administration.
- Using technology to plan and implement comprehensive systems of effective assessment and evaluation.
- Understanding the social, legal, and ethical issues related to technology and model responsible decision-making related to these issues.

Staff Technology Usage

Teachers implement curriculum plans that include methods and strategies for applying technology to maximize student learning. Among other uses, teachers have shown the ability to facilitate technology-enhanced experiences that address content standards and student technology standards, use technology to support learner-centered strategies that address the diverse needs of students, apply technology to develop students' higher order skills and creativity, and manage student learning activities in a technology-enhanced environment.

Teachers also apply technology to facilitate a variety of effective assessment and evaluation strategies. They

have demonstrated the ability to apply technology in assessing student learning of subject matter using a variety of assessment techniques, use technology resources to collect and analyze data, interpret results, and communicate findings to improve instructional practice and maximize student learning, and apply multiple methods of evaluation to determine students' appropriate use of technology resources for learning,communication,and productivity.

Options for Closing the Student Technology Gap

By changing the focus of curriculum and methods for delivery of instruction, and by empowering students through technology, the District can produce a learning environment where students can be expected to achieve at higher levels. The District will use a variety of methods to measure improvement in student achievement with the implementation of technology. Administrators will monitor student quantitative and qualitative assessment indicators to determine whether or not student performance has increased due to educational technology integration.

Option for Closing the Staff Technology Gap

The District will ensure that the skills of the staff are current and relevant. In order to achieve this, the following objectives have been established to benchmark a method for closing the staff skill gap:

- Develop a district professional development plan that addresses the key changes the district needs to make to achieve its educational vision and goals. This plan should reduce teacher isolation, ground teachers in instructional methodologies to support student learning, provide for a variety of learning opportunities for teachers, including on-line and distance learning options, and should establish district expectations for teacher performance and competency in the use of technology to support instruction.
- Establish teacher competency standards for technology and use them to screen applicants and establish performance goals for staff.
- Provide on-going training in both instructional design and delivery support strategies. Continue to build teacher expertise using technology, especially in spreadsheets, databases, graphics, and presentation skills and their application in subject matter instruction and learning.
- Ensure that technology training includes authentic tasks to demonstrate how to apply the technology in education; give teachers projects to do using the technology for instruction to support student learning and development of higher order thinking skills.
- Provide professional development to foster better understanding of what is actually assessed by the Ohio Proficiency Tests test and how to address identified needs in the classroom using current instructional software.
- Provide professional development to staff on how to monitor instruction through the use of alternative assessments.
- Provide increased development and support for the principal at each school to serve as an effective instructional and technology leader.

2.2 Technology Inventory

Category: "Elementary" Computer Systems

System Type	Instructional	% of Total	Administrative	% of Total
Current	2164	21	0	0
Aging	5528	55	277	100
Legacy	2447	24	0	0
Total	10139	100	277	100

Category: "High School/Career Ctr" Computer Systems

System Type	Instructional	% of Total	Administrative	% of Total
Current	963	16	0	0
Aging	3871	66	483	100
Legacy	1045	18	0	0
Total	5879	100	483	100

Category: "K-8" Computer Systems

System Type	Instructional	% of Total	Administrative	% of Total
Current	2	1	0	0
Aging	112	74	9	100
Legacy	38	25	0	0
Total	152	100	9	100

Category: "Middle School" Computer Systems

System Type	Instructional	% of Total	Administrative	% of Total
Current	720	14	0	0
Aging	3414	67	314	100
Legacy	950	19	0	0
Total	5084	100	314	100

Quality of Technology Resources

The overall quality of technology resources within the CPS District is good but its use is not standardized across similar classroom types, e.g., elementary/middle/high. One of the key initiatives of the Instructional Information Services Group is to coordinate all instructional technology software acquisitions to be aligned with technology standards defined by the Curriculum Development group and the State of Ohio. This alignment and standardization will seek to ensure consistency of the learning experience across different classrooms and different school buildings within the District.

Quantity of Technology Resources

Numerous desktop pc's and instructional software technologies exist within the District and are being utilized in some manner. Specifically, within the Elementary Schools there are 19 software applications, Middle Schools – 11 software applications

High Schools / Career Centers – 20 software applications being utilized. In addition, Microsoft Office Suite and Internet Resources are available in most buildings.

Distribution of Technology Resources

The distribution of computer resources within the District encompasses the most density within the Middle Schools the least density within the High Schools with the Elementary Schools in between. The High School density of PC's is skewed by the nature of the Career Centers where many more technology resources exist than at 'regular' high schools.

2.3 District Infrastructure and Connectivity Status

Building Level Networking

Variations in technology needs, uses, and equipment distribution affect capacity and network performance uniquely at each building.

District Level Networking

Network capacity between buildings, District offices and the Internet has been significantly increased in recent years. Fiber optic cable and SBC's Gigaman service are currently installed.

Capacity monitoring and technology upgrading in this area are critical ongoing tasks. The ability of the distribution network to deliver content in a timely fashion has direct impact on instruction.

Internet and Telecommunications

In 2002-2003 the district more than doubled it's Internet access capacity. Technology was implemented which provided two independant sources of internet access to insure high availability at the classroom level.

Internet access performance is a reflection of the entire length of the Internet trip. The end to end journey is affected by the local computer, the building network, the district network, Firewalls and cache servers, the route through the Internet and the destination web site equipment. Any participating piece of technology along the route can be the culprit when issues occur.

Telephone Services Distribution

Telephone service continues to be primarily in administrative areas. Use of phones in classrooms is a topic of exploration. The strength of the district network makes Voice over IP a service consideration. Building phone systems and services are being re-evaluated as part of the Facilities Master Plan.

Distance Learning Facilities

Videoconferencing
The Columbus Public Schools district wide videoconferencing network provides students, staff, and community access to educational opportunities, information resources and programming. This CPS videoconferencing network consists of 17 installations and 7 mobile units providing access to professional development, student enrichment and courses for credit from anywhere in the world. CPS is also connected to the state network allowing access to over 700 systems state wide, including K-12 content providers such as zoos, museums and universities.

In the next three years CPS is planning to upgrade our network to accommodate IP protocol for external connectivity so that we can have a greater impact in the classroom by offering even more content providers through this growing connection protocol.

Web Casting
CPS currently has web casting ability district wide to every desktop. This capability will be made available on the CPSNet web page for district communications, professional development and curriculum rich video content through the computer network.

In the next three years CPS will be providing more curriculum content channels in all areas that can be used by CPS teachers. Providing multiple channels of web casting will provide better equity in access to this data.

Video On Demand
Video on demand (VOD) is currently being used as a new medium to deliver specific video clips that can teach a specific curriculum concept in a short segment. These materials are being aligned to state standards for classroom use. VOD is also being used for internal communications and staff development, delivering these random access materials directly to the desktop.

In the next three years CPS will be providing more curriculum content in all areas that can be used by CPS teachers. Full screen VOD is a must for full integration of this new medium. Customized locally produced media will provide the full integration of this material.

Audio Visual
CPS has an existing library of educational media resources that mat be borrowed by using an on-line booking system. Any CPS educator may sign out materials for instructional use, many that have been linked to curriculum outcomes. Additionally, all schools have the ability to sign out unique AV equipment to supplement on-site equipment. Examples of equipment available are portable PA systems, digital cameras and data projects.

In the next three years CPS will be providing more curriculum content in all areas that can be used by CPS teachers. Existing materials will be converted to digital deliver systems through the CPS data network creating more VOD opportunities. DVD and CD-ROM production is increasing and will be evaluated for the best applications of this technology.

District Network Architecture

ONEnet WAN diagram imported Oct 24, 2003, 8:49 AM

Network Architecture file uploaded Jun 19, 2003, 12:46 PM

Network Architecture

The following refers to and describes the Network Architecture file that is uploaded above:

The Email system, supported by three IBM RS6000 servers, does not interact with any other components in the infrastructure. Specialized servers, such as the PhoneDialer, Trapeze MapNet, and OHM servers, function to provide data to the Student Information System (SIS). SIS runs on Oracle Database 8i and is housed on an EMC Symmetrix platform. The Web Application, Report, Production and Development Database servers are housed on four HP 9000 RP 7400 platforms. They interact with SIS to, among other functions, pull data and generate reports. The EMC Clarion runs on Oracle Database 8i and houses file systems for the Tech Server and a File Server (KDC6 in the diagram), but does not share data with any other components in the current infrastructure. The Notes Application servers, housed on an IBM RS600 and NetFinity 5500, Accountability and Program Evaluation servers are stand-alone application servers and do not interact with any components in the infrastructure.

2.4 Curriculum/Technology Integration

Existing Technology Initiatives

The following are the current district technology initiatives:

1. EETT Grant - 31 schools, focus on integration of math and technology

2. OhioLIT - administrator technology leadership PD; first year 59 participants; goal over three years is for all building and central administrators to participate.
3. Summer Technology Professional Development-Technology courses available to all CPS staff on a voluntary basis.
4. ADVENTURES in Technology-Professional Development for all elementary teachers over a three year period.
5. CPS/OSU Technology Outreach Courses-graduate level courses offered quarterly with limited teacher fee waivers.
6. New Teacher Orientation - new teachers attend on voluntary basis for technology setup, policies and OSN certification.
6. Library Automation-phasing in over three year period through LSTA grant.
7. Computer Awareness Middle School course
8. Technology Curriculum Development
9. CD-ROM Video Communication of various professional development initiatives.
10. Web Casting - web streaming of curriculum and professional development in real time.
11. VTEL SchoolNet Upgrades
12. LACES: Literacy across Columbus Elementary Schools-district wide reading technology component.
13. High School curriculum projects:
14. Career Education projects:
15. OCCL-Ohio Consortium for Conceptual Learning

Technology Initiatives to Enhance Student Achievement

CPS has identified three focus efforts to enhance student achievement. The first effort will be to provide students adequate access to technology, which will be accomplished by providing students with sufficient hardware and software, scheduling classes and classrooms to maximize student usage, and providing students with the capabilities for remote access to relevant information. The second effort will be to provide ample training for students, which will be accomplished by writing and revising K-12 curriculum that mandates student training in technology use while applying appropriate scope and sequence considerations and the ISTE student standards in coordination with hiring sufficient, qualified staff. The final effort is to use technology to enhance student learning and expand the curriculum. This goal will be realized by budgeting for new technology, integrating goals set forth by the technology plan into K-12 curriculum plans, offering students parts of all technology available in the district, and utilizing all distance learning capabilities available within the district.

2.5 Staff Development

Current Technology-Related Staff Development Programs

In order to meet their specific needs, training is designed around the knowledge and skills required using the technology in their various jobs. Training bridges the gap between what the user knows and needs to know. The following training models will be used within the District:

- Train-the-Trainer
- Coaching and Mentoring
- Self-Study Training
- On-the-Job Training
- Site-Based Training
- Peer-Training Model
- Online Training (Blackboard)

Columbus Public Schools will strive to deliver staff development in variety of ways, including:

- Arranging with local universities to obtain college credit for technology coursework
- In-service day technology staff development
- Offering stipends or extended time pay for voluntary training during non-school hours
- Teacher substitutes for extended training sessions

Sources For Technology-Related Professional Development

The district has computer labs in each middle and high schools career centers along with two at the district technology office. All of these labs are available after school, on Saturdays and during the summer for professional development. The district technology labs are used during the school day for professional development. In addition, the district has begun to implement the use of Blackboard, an online tool, to deliver professional development 24/7. The district will offer educational professional development through the Education Development Center-EDC and develop its own courses to compliment and align with student curriculum and technology Ohio Academic Content Standards.

Role of Technology in Staff Development

One common issue districts face is the need to gain a clearer understanding of the challenge they face in integrating technology into instruction. That challenge is personified by the role of classroom teacher. It is only through the extent to which an individual teacher adopts and adapts technology to her own instructional practice that students will be given the opportunity to learn using technology. Students can independently learn many technology skills. But the teacher is instrumental in guiding the student's mastery of academic learning, and technology is one tool a teacher can use to aid that process. In many ways integration of technology in instruction is synonymous with staff development. A successful staff development program for technology integration will recognize that it must be on going and move teachers through several levels of evolution to reach their highest level of success. Recent research demonstrates this teacher evolution. It begins where many 'teachers are' by providing a foundation in the basic understanding of the new technology being employed. Gradually, as teachers become more comfortable using the technology, they begin to adopt it into their classroom to support their existing instructional practice. Over time, through interaction with other teachers and successful experimentation with the technology, research has shown that technology can be a powerful motivator for the reform of instructional practice as teachers incorporate project-based learning and change their roles from dispensers of knowledge to facilitators of knowledge.

The job of staff members is much more demanding today than it was ten years ago. Adults need time to experiment and to become comfortable with new job-related techniques and with supporting technology. Staff members need to be supported in this learning process. They need time to learn to use technology and how to manage the use of technology in the classroom.

Recommendations:

- Continue the present program with emphasis on the integration of technology into the curriculum.
- Emphasis on training teachers on how to integrate technology into instruction and incorporating project-based learning methods.
- Ensure that technology training includes authentic tasks to demonstrate how to apply technology in education.
- Hold teacher learning days for curriculum integration of technology.
- Provide staff development training during in-service days.

- Provide incentives for teachers to integrate technology into the classroom.
- Provide additional support for integrating technology into the classroom.
- Utilize the staff development resources within the Central Ohio area.
- Establish a floating substitute to free staff during the school day to participate in technology professional development.
- Modify school schedules to allow minimum days on a regular basis to provide professional development time.
- Establish teacher competency standards for technology and use them to screen applicants and establish performance goals for staff.
- Establish more professional development opportunities through the use of compressed video and satellite.
- Continue development of online delivery methods.

2.6 Technology Support

Support For Learning Resources and Instructional Technology

Quality issues:

District technology support staff strive to meet the needs and demands of their user community. The demand for support is expected to increase as classroom technology alignment with curriculum content increases.

The BETA survey, conducted through SchoolNet, identified 58% of teachers have received 5 hours or less of instructional technology professional development in the school years of 2000-2002 and 78% have not completed basic skills training. The survey also identified that: 81% of teachers occasionally or never use technology to support standards-based curriculum, 86% never use real time video conferencing for multi-site learning, 71% never use integrated learning systems (diagnostic, instruction and assessment), 16% daily use technology to align student activities and assessments with curriculum goals/standards, and 12% daily customize work to allow students to work at own level / speed.

Quantity issues:

Technology support requirements continue to grow faster than staffing levels. Some of the imbalance has been offset by efficiency improvements.

The Instructional Information Services Group provides the professional development activities for teachers in support of utilizing technology to deliver curriculum content. They are of implementing a new online training delivery software tool called Blackboard. This will allow the District to create professional development curriculum with written, spoken, and visual media to deliver appropriate content on demand. Although this tool will not replace the trainers currently utilized by the department, it will allow for an extended reach and increased capacity for reaching the target audience within the District.

Support For Information Management Functions

Quality issues:

The District continues to struggle with data quality issues caused by the lack of integration between software applications used across different functional areas. The problem is compounded by one deep support staffing patterns. The situation results in difficulties when developing reports for Federal, State, or strategic management purposes. The main functional areas within the District where these information issues exist are related to Student Information, Human Resources, Finance and Accounting.

Quantity issues:

The District supports a wide range of software applications and technologies. Each competes for limited fiscal and support resources on an annual basis. The effectiveness of the entire organization is affected by this constraint.

Support For Communications and Network Infrastructure

Quality issues:

The quality of the communications and network infrastructure has been significantly upgraded over the past couple of years. There are still upgrades required to improve the network's capacity and support the bandwidth required at the High Schools and Middle Schools where the internet, distance learning and streaming video applications are currently being utilized or expected to increase. Gigaman upgraded the external portion of the network to increase capacity between school and administrative buildings, an additional upgrade is required to increase the internal portion of the network within certain school and administrative buildings.

The District recognizes that it's communications and network infrastructure will require frequent realignment to enable new types of classroom resources.

Quantity issues:

There are no major quantity issues within the communications and network infrastructure.

Support For Operation, Maintenance, and Other Support

Quality issues:

The District recognizes that the need/demand for technology support continues to grow. Prior technology plans assumed a combination of CPS technical staff and contracted resources to provide support.

In the current budget environment, the ability to supplement with temporary contractors is severely diminished. We anticipate increased risk that the quality of support may decline as a result.

Quantity issues:

The key operation, maintenance, and other support quantity issue continues to center on staffing levels relative to the volume of demand. Classrooms and support efforts are negatively affected when insufficient time is available to properly complete necessary tasks and projects.

Components of an End User Support System

An enterprise technology architecture is a framework and set of guidelines that are used to build and manage information systems. The ideal architecture permits access to the entire system of computers, applications, databases, and network services through a single workstation that is easy to use and operates with a common user interface for all educators and administrators.

A technology platform is made up of computers, databases, and communication networks that act as an electronic nervous system capable of supporting a wide array of applications and services.
The overarching goal for the district is to establish a standards-based technology architecture to enable the district to increase the quantity and quality of services to the customers of CPS while at the same time, reducing the cost of providing those services.

The CPS architecture framework defines conceptual component architecture and the information technology

processes and organization to support it. The future CPS technology model includes the following components:

- Design Principals – shared technical characteristics for all IT components to ensure a baseline of interoperability and sound vendor guidelines
- Conceptual Application Architecture - the form and nature of the software packages that are used to create, maintain and manipulate data in support of the districts vision
- Conceptual Information Architecture- the types of data and the structure in which they are housed
- Conceptual Technology Architecture - the computing infrastructure (hardware and network) that supports the data and applications. This also includes the day to day operating and support models
- Instructional Technology Delivery - the curriculum, delivery methodology, teacher integration and on-going professional development models
- Technology Acquisition and Management – how technology is acquired and managed within the district.

The CPS team developed an architecture framework that supports the educational and administrative requirements as well as adopts industry standards that facilitate easy integration between architecture components.

Phase 3 - Review Goals & Identify Strategies
Phase 4 - Develop Action Plans & Identify Support and Staffing

Goals & Strategies

Goal #1: (DCIP 1) Quality Instruction.
The District will ensure that teachers have the knowledge, skills and expertise to effectively deliver instruction to increase academic achievement for all students

Strategies:

Strategy #1: Enterprise Application Architecture - The District will focus on coordination and alignment of its software usage across the entire District.

Strategy #3: Professional Development - Coordinated activities which focus on teacher, administrator and staff readiness to effectively use District technology.

Strategy #4: Technology / Curriculum Integration - Activities which focus attention on alignment of available technology with curriculum content and activities.

Goal #2: (DCIP 2) Committed Leadership
The district will ensure that teachers have the knowledge, skills, and expertise to effectively deliver instruction to increase academic achievement for all students.

Strategies:

Strategy #1: Enterprise Application Architecture - The District will focus on coordination and alignment of its software usage across the entire District.

Strategy #5: Technology Architecture Alignment - Activities which position phsyical technology for curriculum and administrative needs.

Goal #3: (DCIP 3) Opportunity to Learn
The district will remove institutional barriers that prevent students from learning as well as they should.

Strategies:

Strategy #1: Enterprise Application Architecture - The District will focus on coordination and alignment of its software usage across the entire District.

Strategy #2: Planned Technology Refresh cycles. The District will strive to establish regular update and replacement cycles for its technology.

Strategy #4: Technology / Curriculum Integration - Activities which focus attention on alignment of available technology with curriculum content and activities.

Goal #4: (DCIP 4) Student Motivation
The district will examine issues surrounding student motivation and examine why students sometimes choose to give less than their best effort.

Strategies:

Goal #5: (DCIP 5) Efficient/Equitable Operations
The district will adopt practices that govern the allocation of resources in an equitable manner and that lead to a more efficient operation.

Strategies:

Strategy #1: Enterprise Application Architecture - The District will focus on coordination and alignment of its software usage across the entire District.

Strategy #2: Planned Technology Refresh cycles. The District will strive to establish regular update and replacement cycles for its technology.

Strategy #3: Professional Development - Coordinated activities which focus on teacher, administrator and staff readiness to effectively use District technology.

Strategy #4: Technology / Curriculum Integration - Activities which focus attention on alignment of available technology with curriculum content and activities.

Strategy #5: Technology Architecture Alignment - Activities which position phsyical technology for curriculum and administrative needs.

Goal #6: (DCIP 6) Parent/Community Involvement
The district will engage the active involvement of parents, businesses, and political and civic organizations to support student achievement.

Strategies:

Strategy #1: Enterprise Application Architecture - The District will focus on coordination and alignment of its software usage across the entire District.

Strategy Components

Strategy #1: Enterprise Application Architecture - The District will focus on coordination and alignment of its software usage across the entire District.

Relevant Goals

Goal #1: (DCIP 1) Quality Instruction.
The District will ensure that teachers have the knowledge, skills and expertise to effectively deliver instruction to increase academic achievement for all students

Goal #2: (DCIP 2) Committed Leadership
The district will ensure that teachers have the knowledge, skills, and expertise to effectively deliver instruction to increase academic achievement for all students.

Goal #3: (DCIP 3) Opportunity to Learn
The district will remove institutional barriers that prevent students from learning as well as they should.

Goal #5: (DCIP 5) Efficient/Equitable Operations
The district will adopt practices that govern the allocation of resources in an equitable manner and that lead to a more efficient operation.

Goal #6: (DCIP 6) Parent/Community Involvement
The district will engage the active involvement of parents, businesses, and political and civic organizations to support student achievement.

Resources and Costs

Workstation & Peripherals	Estimated Cost
None required	2003: $0.00 2004: $0.00 2005: $0.00

None required	2003: $0.00 2004: $0.00 2005: $0.00
Software & Supplies	**Estimated Cost**
Consultants will be required for the data&application web portal development, web application re-engineering, build of phase II of the data warehouse, implementing an ERP solution, purchasing ERP software, supporting the administration of instructional systems, and creating a phase II dashboard.	2003: $775,000.00 2004: $3,575,000.00 2005: $3,350,000.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Network & Infrastructure	**Estimated Cost**
None required	2003: $0.00 2004: $0.00 2005: $0.00
Additional infrastructure is required to support web applications, implementation of an ERP system, and growth in data storage.	2003: $650,000.00 2004: $1,000,000.00 2005: $750,000.00
Security	**Estimated Cost**
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Policy & Procedures	**Estimated Cost**
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Maintenance & Upgrades	**Estimated Cost**
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00

Relevant State Technology Indicators

Electronic Resources (Administrative)
Planning and Coordination
Technical Training

Technology Support

Performance Indicators

Customer satisfaction is the best general indicator of performance across the multiple software efforts represented in this strategy. The performance goal is a general sense of progress and improvement by the user community. Individual action items in the strategy will each generate their own level of customer reaction or acceptance.

Action Steps

Action Step	Benchmark	Start	End
Data & Application Web Portals - The District will create data & application portals to provide a framework for delivering information using Web technology. The framework implemented will provide users with a customizable, web look and feel front end.	Growth of content available to schools using this technology will be used to measure progress and number of users accessing this technology will be used to measure progress.	10-2002	06-2005
Enterprise Application Review - Examine district record keeping software. Identify and recommend application software changes.	Contracted vendor will submit a final report on their effort to identify an Enterprise Application Plan.	01-2003	10-2003
Dashboard Phase I. The District will build a software application which provides CPS executives with a graphical and numeric view of key performance indicators that gauge whether or not the district is meeting its gaols and objectives. Phase I delivers 34 high level metrics through the dashboard.	School principals reviewing their schools data via the Dashboard Phase I tool.	04-2003	08-2003
Web Application Re-Engineering. Re-engineering of CPS developed programs to align with AAL migration to web based delivery.	Current locally developed SIS applications continue be available after AAL moves exclusively to its web based version.	06-2003	06-2004
Design and implement systems that support the data collection, administration, reporting, and analysis of instructional initiatives. Current examples are the LACES reading assessment initiative and the Student Assistance and Intervention for Learning (SAIL) program.	The successful collection of all LACES and SAIL data and subsequently the successful presentation of data to the stakeholders.	09-2003	06-2005
Student Record Management upgrade review. Analysis and selection of software components that improve the District's management of student records. The effort will consider the opportunities for improvement by upgrade of current systems or replacement with stronger systems. Funding constraints may extend the timeline for this effort.	Active use of enhanced student records capability by schools.	11-2003	08-2006

Data Warehouse Phase II - The data warehouse project focuses on creation of an information repository accessible through analytical tools. The goal of the project is to provide enhanced decision support information to District leaders. Phase I of the Data Warehouse strategy was an intitial design and build. It included building the following data marts: staff & student demographics, final & period marks, enrollment & attendance, discipline, and test scores. Phase II of the data warehouse strategy is to continue to add data marts to the data warehouse. This includes the following data marts: program participation, student course schedules, cross enrollments, EMIS period attendance, partental information, and staff certification & attendance. In addition, data marts also will be developed that align with the distric's continuous improvement plan.	Progress for this activity will be seen as each additional data area becomes available for online use.	12-2003	07-2006
Implement an Enterprise Resource Planning (ERP) system based upon recommendation from the Enterprise Application Review (EAR). The new ERP system replaces the home grown Personnel system, the USAS Financial system, and the USPS Payroll system.	The successful implementation of the ERP modules.	01-2004	06-2005
Expand data center infratstructure to support the increased Web applications and associated data content. This includes additional database servers, application servers, storage, storage area network (SAN) switches, backup appliances, and robotic tape libraries for archived data.	The installation of data center infrastructure components.	01-2004	06-2005
Dashboard Phase II. Provide 30 additional high level metrics through the dashboard.	The full 30 metrics are available to any principals desktop computer.	04-2004	09-2004
Implement comprehensive Business Intelligence tools including ad-hoc reporting, data analysis, and data mining tools. Casual users, power users, and technology analysts will be trained to use Business Intelligence tools to meet the district's operational requirements, and analyze data to affect tactical and strategic plans.	The increased use of Business Intelligence by users.	07-2004	06-2006

Leadership

Management Information Services and Treasury will take the lead in implementing the Enterprise Application Architecture.

Key Personnel

Rick Reynolds, CIO
Jerry Bucilla, Treasurer
Tim Phillips, Applications Manager
Linda Fleischer, Student Application Manaher
Donn Shafer, Business Applications Manager
Ralph Vaughn, Database Administrator

Strategy #2: Planned Technology Refresh cycles. The District will strive to establish regular update and replacement cycles for its technology.

Relevant Goals

Goal #3: (DCIP 3) Opportunity to Learn
The district will remove institutional barriers that prevent students from learning as well as they should.

Goal #5: (DCIP 5) Efficient/Equitable Operations
The district will adopt practices that govern the allocation of resources in an equitable manner and that lead to a more efficient operation.

Resources and Costs

Workstation & Peripherals	Estimated Cost
New workstations will replace those purchased with Original SchoolNet funds (1995).	2003: $836,000.00 2004: $0.00 2005: $80,000.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Software & Supplies	**Estimated Cost**
Software updates will be purchased to keep systems up to date.	2003: $20,000.00 2004: $20,000.00 2005: $20,000.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Network & Infrastructure	**Estimated Cost**
Network requirements include the regular update and replacement cycles as established by district.	2003: $100,000.00 2004: $3,800,000.00 2005: $4,500,000.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Security	**Estimated Cost**
None required	2003: $0.00 2004: $0.00 2005: $0.00

None required	2003: $0.00 2004: $0.00 2005: $0.00
Policy & Procedures	Estimated Cost
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Maintenance & Upgrades	Estimated Cost
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00

Relevant State Technology Indicators

Classroom Technology
Connectivity
Electronic Resources (Administrative)
Electronic Resources (Instructional)
Planning and Coordination

Performance Indicators

The average age of technology components in service will be used as an indicator of the refresh/replacement strategy success.

The distribution of aging technology components will be used as an indicator of technology update / replacement allocation equity.

Action Steps

Action Step	Benchmark	Start	End
Network Electronics Replacement Cycles. Identify and adopt a replacement/upgrade planning cycle for computer network electronics.	Network infrastructure capacity and performance meet the needs of the District.	07-2003	06-2004
Computer Replacement Cycles. Identify and Adopt standard planning cycles for replacement of District computer equipment. Software replacement cycles must be coordinated with the hardware cycle.	Maintain the district computer resources so that they are up to date and able to run systems and programs that are equal to current and emerging practices noted in the business and industry environments.	10-2003	01-2005

Instructional Software Replacement/Version Upgrade Cycles. Identify instructional software currently in use, its alignment with specific curriculum objectives,the number of students that use it, and the cost to upgrade or replace it. Develop plan for regular update or replacement of instructional software that has clear curriculum benefit and alignment.	Maintain the district computer software resources so that they are up to date and able to the educational needs of the district	02-2004	01-2005
Printer and Peripheral Replacement Cycles. Identify and adopt standard replacement cycles for peripherals whose use is shared by multiple users.	Maintain the district resources so that they are up to date and able to support systems and programs that are equal to current and emerging practices noted in the business and industry environments.	03-2004	01-2005

Leadership

Key Personnel

Strategy #3: Professional Development - Coordinated activities which focus on teacher, administrator and staff readiness to effectively use District technology.

Relevant Goals

Goal #1: (DCIP 1) Quality Instruction.
The District will ensure that teachers have the knowledge, skills and expertise to effectively deliver instruction to increase academic achievement for all students

Goal #5: (DCIP 5) Efficient/Equitable Operations
The district will adopt practices that govern the allocation of resources in an equitable manner and that lead to a more efficient operation.

Resources and Costs

Workstation & Peripherals	Estimated Cost
Workstations will be purchased to comply with current standards and up grade on a staggered schedule as existing technolgies become outdated.	2003: $305,000.00 2004: $260,000.00 2005: $300,000.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Software & Supplies	**Estimated Cost**
None required	2003: $0.00 2004: $0.00 2005: $0.00

None required	2003: $0.00 2004: $0.00 2005: $0.00
Network & Infrastructure	Estimated Cost
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Security	Estimated Cost
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Policy & Procedures	Estimated Cost
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Maintenance & Upgrades	Estimated Cost
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
None required	2003: $0.00 2004: $0.00 2005: $0.00

Relevant State Technology Indicators

Electronic Resources (Instructional)
Professional Development
Technical Training

Performance Indicators

The number of state identified teacher and administrator technology certifications will be tracked as as a measure of success.

Action Steps

Action Step	Benchmark	Start	End

Summer Technology Professional Development - Professional Development course opportunities at novice and intermediate levels available to all teachers. Courses offered face to face and online.	Number of teachers voluntarily attending varies each year.	06-2003	08-2003
Enhancing Education Through Technology (EETT)-Title II-D Competitive Grant-This grant provides the district the capacity to offer professional development to the staffs of 20 elementary schools and 11 middle schools with a focus on improving student achievement in the area of mathematics with the integration of technology. Elementary schools will use an integrated math software package while middle schools will use an online delivery system; both aligned to the Ohio Content Standards.	The district will implement these programs at the 31 schools with hardware and software installation along with a series of professional development throughout the school year. The online delivery tool will be configured and deployed for use by professional staff, students and parents/guardians and has the capacity to track participant use.	07-2003	06-2004
The Ohio Leadership for Integrating Technology (Ohio Lit) Program provides district administrators access to quality leadership development focused on systems change and technology integration. Administrators learn strategies for using instructional technology to improve education and how to lead their staffs to realize this vision. Administrators will identify and analyze data to understand school needs, capacity and readiness for technology integration and build school capacity to carry out the plan to realize the vision.	In 2003-2004 the district will provide 24 hours of training for the first 59 administrators who will blend a vision for school improvement with a vision for technology integration. All central and building adminstrators will be offered this training over the three year period.	07-2003	06-2006
Columbus Public Schools/Ohio State University Outreach Courses- A limited number of fee waivers are available as part of our working relationship with the Ohio State University. These fee waivers entitle CPS teachers to enroll in graduate level courses focused on implementing technology in the classroom. Course development and instruction is a collaborative effort through CPS and OSU staff members.	Courses are offered on a quarterly basis. Teachers enroll through a streamlined process online at the CPS website. Course offerings are reviewed quarterly by district and OSU personnel.	07-2003	06-2006

ADVENTURES in Technology creates an opportunity for teachers in elementary schools to achieve Ohio SchoolNet Novice technology certification using an integrated curriculum model. Teachers have the option to attend the sessions face to face or through online participation. Specific schools are identified each year for training. All district elementaries will be given the opportunity to participate in the programs during the three years.	The district will deliver the program at 38 elementary schools each year until all elementaries have been trained.	07-2003	06-2006
New Teacher Orientation-Professional Development is offered to all newly hired teachers. District technology setup, policies and Ohio SchoolNet Novice certification is offered.	New teachers attend on a voluntary basis.	10-2003	11-2003
Summer Technology Professional Development - Professional Development course opportunities at novice and intermediate levels available to all teachers. Courses offered face to face and online.	Number of teachers voluntarily attending varies each year.	06-2004	08-2004
New Teacher Orientation-Professional Development is offered to all newly hired teachers. District technology setup, policies and Ohio SchoolNet Novice certification is offered.	New teachers attend on a voluntary basis	08-2004	08-2004

Leadership

The department of Instructional Technology will be responsible for these efforts. Individual staff will be assigned to facilitate these programs.

Key Personnel

These activities will be reviewed and adjusted as needed. Key personnel in those decisions will be:
Dr. Paul Lucas, Director of Instructional Technology
Dr. Marvenia Bosley, Chief Academic Officer
Ms.Josephine Scott, Executive Director, Curriculum and Staff Development
Mr. Richard Reynolds, Chief Information Officer

Strategy #4: Technology / Curriculum Integration - Activities which focus attention on alignment of available technology with curriculum content and activities.

Relevant Goals

Goal #1: (DCIP 1) Quality Instruction.
The District will ensure that teachers have the knowledge, skills and expertise to effectively deliver instruction to increase academic achievement for all students

Goal #3: (DCIP 3) Opportunity to Learn
The district will remove institutional barriers that prevent students from learning as well as they should.

Goal #5: (DCIP 5) Efficient/Equitable Operations
The district will adopt practices that govern the allocation of resources in an equitable manner and that lead to

a more efficient operation.

Resources and Costs

Workstation & Peripherals	Estimated Cost
Library Automation workstations	2003: $58,905.00 2004: $106,260.00 2005: $0.00
Library automation printers, scanners	2003: $74,736.00 2004: $99,697.00 2005: $84,000.00
Software & Supplies	**Estimated Cost**
Library automation SIRSI software	2003: $142,757.00 2004: $134,235.00 2005: $0.00
Library automation barcodes, protectors, fees	2003: $174,932.00 2004: $165,126.00 2005: $217,267.00
Network & Infrastructure	**Estimated Cost**
Library automation electrical and internet wiring.	2003: $96,000.00 2004: $184,000.00 2005: $0.00
Telephone connections to accomodate new library automation locations.	2003: $390.00 2004: $920.00 2005: $0.00
Security	**Estimated Cost**
Existing equipment security tactics are sufficient.	2003: $0.00 2004: $0.00 2005: $0.00
Existing data security tactics are sufficient.	2003: $0.00 2004: $0.00 2005: $0.00
Policy & Procedures	**Estimated Cost**
Existing policies are sufficient.	2003: $0.00 2004: $0.00 2005: $0.00
Existing procedures are sufficient.	2003: $0.00 2004: $0.00 2005: $0.00
Maintenance & Upgrades	**Estimated Cost**
Existing maintenance tactics are sufficient.	2003: $0.00 2004: $0.00 2005: $0.00
Existing upgrade tactics are sufficient.	2003: $0.00 2004: $0.00 2005: $0.00
No additional items needed.	2003: $0.00 2004: $0.00 2005: $0.00

Relevant State Technology Indicators

Classroom Technology
Connectivity
Electronic Resources (Instructional)
Planning and Coordination
Professional Development
Technical Training
Technology Support

Performance Indicators

Technology in the classroom is both a supplemental resource and a basic communication tool used by both students and teachers.

The effort to establish a better level of integration with curriculum focuses on alignment of technology deployment with the instructional process.

Curriculum guides will be used to provide insight into the alignment of technology and instructional objectives.

Action Steps

Action Step	Benchmark	Start	End
Library Automation-Through the Metropolitan Educational Council via a Library Services and Technology Act grant, CPS has automated four middle school libraries in 2002-2003. CPS will automate 48 schools in 2003-04 and the remaining 95 in 2004-05	The number of schools which are operational using this technology will be used to indicate the level of progress.	03-2003	06-2005
Computer Awareness / Computer Literacy Course Integration. Review and consolidate seperate basic computer literacy efforts into unified courses used commonly in District Middle Schools.	Improved coordination of instructional effort in this area across all Middle Schools by 2004-2005 school year.	06-2003	06-2004
Technology Curriculum Development. The District will focus on identification, coordination and integration of technology use into the curriculum guides.	Curriculum guides will identify how technology is to be used to achieve specific results.	06-2003	07-2006
CD-ROM Video Communication-Creation of communication programs for random access and distribution will be created as solution for home access by staff members.	The number of videos created and distributed will be used to indicate the level of progress.	09-2003	06-2006
Web Casting-The district will implement web streaming of both curriculum and professional development broadcasts over the web using one channel. Additional channels will be added pending budget approvals.	Tracking the number of students and staff using this technology will be used to indicate the level of progress.	09-2003	09-2006
VTEL SchoolNet Upgrades-Implementation of upgrades will maintain connectivity using the new state VTEL Standards.	School Board approval and actual installation will indicate the first steps of progress.	10-2003	07-2004

Distance Learning Internal Web Page-Creation of the web page will be used as a marketing tool to inform staff of Distance Learning opportunities.	Tracking the amount of usage will be used to indicate the level of progress.	01-2004	06-2004
Video on Demand-The district will deliver both video communication and professional devlopment through the district's internal web site.	Tracking the amount of usage will be used to indicate the level of progress.	01-2004	06-2006
Distance Learning Courses for Students-Implementation of these courses will increase the variety of courses, including foreign language, Advanced Placement and PSEO, available to students.	Tracking the amount of usage will be used to indicate the level of progress.	10-2004	06-2006

Leadership

Leadership for these efforts will be provided by the Department of Instructional Technology in conjunction with the Curriculum Department.

Key Personnel

Dr. Marvenia Bosley, Deputy Superintendent
DR. Paul Lucas, Director of Instructional Technology
Josephine Scott, Executive Director, Curriculum and Staff Development
Brend Gonzalez, Supervisor, Library Media Services

Strategy #5: Technology Architecture Alignment - Activities which position phsyical technology for curriculum and administrative needs.

Relevant Goals

Goal #2: (DCIP 2) Committed Leadership
The district will ensure that teachers have the knowledge, skills, and expertise to effectively deliver instruction to increase academic achievement for all students.

Goal #5: (DCIP 5) Efficient/Equitable Operations
The district will adopt practices that govern the allocation of resources in an equitable manner and that lead to a more efficient operation.

Resources and Costs

Workstation & Peripherals	Estimated Cost
Anticipated replacement of some aging computers and servers.	2003: $1,500,000.00 2004: $3,000,000.00 2005: $3,500,000.00
Replacement of aging printers	2003: $500,000.00 2004: $1,000,000.00 2005: $1,500,000.00

Software & Supplies	Estimated Cost
Maintain the district software so that is current and compatable with standard business practices. Ensure that all licenses are maintain and accounted for.	2003: $2,130,000.00 2004: $1,920,000.00 2005: $25,000.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Network & Infrastructure	**Estimated Cost**
A planned 4 year network upgrade has been proposed. This will align the infrastructure with the district's educational curriculum, business management, and data needs. The district has standardized on CISCO equipment. This standardization will allow us to reduce the overall cost of maintenance and will aid us to maintain service levels that will meet the needs of the district.	2003: $100,000.00 2004: $3,800,000.00 2005: $4,500,000.00
Internal wiring to accommodate Move, Add and Change activity,swing space, and factilities remodeling / replacement projects. First two phases of power protection (Generator/Battery Backup) equipment for critical sites to protect network availability to the District.	2003: $400,000.00 2004: $1,200,000.00 2005: $1,200,000.00
Security	**Estimated Cost**
The district has firewall services that helps protect the data from external data manipulation. Logs and access rules are updated and reviewed as needed to help maintain a save and secure data environment. The district will be conducting a data security assessment to evaluate how we can increase data security while allowing the access that is expected and needed by our client base.	2003: $25,000.00 2004: $130,000.00 2005: $25,000.00
None required	2003: $0.00 2004: $0.00 2005: $0.00
Policy & Procedures	**Estimated Cost**
Data polices and procedure are constantly being created, reviewed, and updated on an as needed basis. distribution of the policies and procedures are done but not limited via e-mails, intranet postings, interoffice memos, and procedure manuals postings.	2003: $0.00 2004: $0.00 2005: $0.00
Existing procedures are sufficient.	2003: $0.00 2004: $0.00 2005: $0.00
Maintenance & Upgrades	**Estimated Cost**
Maintenance costs are expected to increase as the quantity of equipment covered by warranty decreases. Planned replacement cycles being considered will help reduce maintenance costs. Costs for this area were included in the end-user support section.	2003: $0.00 2004: $0.00 2005: $0.00
The level of upgrades that occur will depend on funding available each budget year.	2003: $0.00 2004: $0.00 2005: $0.00
None identified.	2003: $0.00 2004: $0.00 2005: $0.00

Relevant State Technology Indicators

Classroom Technology

Connectivity
Electronic Resources (Administrative)
Electronic Resources (Instructional)
Planning and Coordination

Performance Indicators

This strategy will deal with a broad range of technologies and services. Implementation stability and capacity relative to operational needs are the key indicators of success.

Action Steps

Action Step	Benchmark	Start	End
Wireless Carts – This wireless technology though used primarily for the classroom could and should be used for the education of students, facility and parents. This technology would allow for the tempoary placement of multiple devices in locations that have not been configured for more than one device allowing for better utilization of facility and human resources.	Better utilization of classroom space and time, increased interest on part of instructors and students. This should be shown but not limited to, utilization of rooms that currently are not computer friendly as to difficulty or restrictive to wire for data. An increased interest on the part of the students and faciculity to use technology because of increased flexibility.	06-2003	06-2005
Network Enhancements - Ongoing adjustment of data communication network design to accomidate evolution of instructional technology use.	Completion of scheduled upgrade at each school in the upgrade plan.	07-2003	06-2006
Server Consolidation - The district will move toward consolidating the indiviual site based file servers into centrilized areas. This consolidation will enable server operations to be managed in a controlled and secure environment.	To place server operations in an secure and controlled environment were they can be properaly managed and maintained.	04-2004	06-2005
Storage Area Network - Expand the data network to include a phased in Storage Area Network (SAN.	Through a phased approach implement a SAN that will maintain the security and integerity of the district's data. Configure systems that currently require independent files storage and backups to utilize the SAN for data operations and support.	06-2004	06-2005
Thin Clients - Along with the SAN implement a process that will study how a Thin Client infrastructure may benifit the educational and business operations of the district.	Impelment a protype environment utilizing thin client technology to study the feziability and impacts to the district	06-2004	06-2005

Building wireless – This configuration is an extension of the wireless cart implementation allowing for the movement of devices building wide without the dependency on hardwired drops in every room. It allows for the creation of a network that is limited only by the creative minds of our students and educators. This building wide wireless would open the door to open air classes and close proximity training with the use of electronic training aids. This would also allow for the use of wireless cameras to monitor interior and exterior fiscal plant. Wireless cameras could be monitored by any administrator with a wireless laptop and access to the correct communication channels.	Increased ability to hold class when and were they are needed with the technology that best presents the subject matter. Allow for more creative use of technology by instructors and more flexibility in management of students, staff, and physical property in part by allowing the administrators to perform administrative tasks without the restraints of an office / wire bound device.	06-2004	06-2005
Metropolitan Wireless Network – The major use of this tool would be as a direct data communication transfer from each CPS location to one of the three core sites. This would be a combination of point to point and multipoint to point, also referred to as matrix solution. This solution has the potential of gigabit transfer rates and could be a partner solution with the City of Columbus.	Data transfer with a reduction in cost over current fixed line data transfer expenses. A solid partnership with the City of Columbus in the sharing of resources, both technical and physical.	06-2004	06-2007
Power protection. The District network distributes commonly used services to all other facilities through four key signal switching sites. The sites service as connection points to District level applications and the Internet. Power deist at those key sites shutdown instructional and business activity across portions of the the District. Power protection in the form of larger union Power Supplies and generator equipment will be added to those key sites.	Computer Operations at schools and district offices will not be affected by power outages at the network signal redistribution sites.	07-2004	06-2006
Scheduled Replacement and Upgrades. Begin phasing in replacement strategy based on available funding and defined strategy.	Equipment replaced tabulated by building and associated with the adopted multi-year strategy.	10-2004	06-2005
2nd phase of Technology Update/Refresh. Second segment of the organization identified in replacement strategy and within available funding	Level of equipment replacement/upgrade by building and associated with the adopted multi-year strategy.	07-2005	06-2006

Leadership

Key Personnel

4.2 Technology Related Staff Development

Staff Development Activity	Start	End	Cost
Video Conferencing	01-2003	01-2006	2003: $84,000.00 2004: $70,000.00 2005: $70,000.00
Peer-Training Model	01-2003	01-2003	2003: $20,000.00 2004: $20,000.00 2005: $20,000.00
Train-the-Trainer	01-2003	01-2006	2003: $20,000.00 2004: $20,000.00 2005: $20,000.00
Self-Study Training	01-2003	01-2006	2003: $11,720.00 2004: $0.00 2005: $0.00
Coaching and Mentoring	01-2003	01-2003	2003: $0.00 2004: $0.00 2005: $0.00
On-the-Job Training	01-2003	01-2003	2003: $0.00 2004: $0.00 2005: $0.00
Site-Based Training	01-2003	01-2003	2003: $0.00 2004: $0.00 2005: $0.00

4.3 Technology-Related End-User Support Services

Technology Support Staffing

The level of technology support staffing continues to lag behind the volume of activity and growth in demand for service. Increases in effeciency have been absorbed by the increasing service demand. The imbalance holds the district back from achieving its full potential.

Staffing levels have a direct relationship to availability of support. The impact of imbalance is similar to what happens when students to teacher ratios are excessive. To be successful with technology the district must become vigilant in its effort to align technical staffing and service demand.

Technology support staffing has historically been provided by either contracted or employed resources. The District generally pays its employees less than vendors charge to contract for the same skills. Because of the cost differential contracted resources should only be considered for temporary needs.

The District shares the beliefs and assumptions on staff development outlined in the Ohio SchoolNet Report on Educational Technology State Plan. We cannot expect the staff of the district to fully understand and effectively utilize the technology applications without being properly trained. When teachers, administrators and other staff using technology are counted the local professional development need has more adult students than most Ohio Districts have K-12 students.

Estimated Cost:

2003: $6,600,000.00
2004: $6,930,000.00
2005: $7,280,000.00

Technology Support Services

End-user support services are critical to the implementation for the District technology strategy and operational effectiveness.

Support and training will be crucial for day-to-day activities. As a result, Instructional Information Support Services will continue to implement the following strategies:

· Instructional Technology staff will continue to provide professional development and guidance for teachers in the areas of project-based learning and technology curriculum integration.

· Instructional Technology staff will continue to provide professional development to principals so that they can continue to provide educational leadership in technology to their staffs. The effort will focus on hands-on mentoring and workshop opportunities.

· Beginning of the year training and staff development for new hires and as refresher courses will be provided.

. In-services dedicated to technology training and staff development will continue to be scheduled. This will include in-service in new technologies deployed by the district and technology integration ideas into the curriculum.

· Develop and implement a staff development training course schedule offered throughout the school year. The training schedule will offer several types of training sessions in computer-software related technologies. The training course offerings will be made available to all district staff. We cannot expect the staff of the district to fully understand and effectively utilize the technology applications without being properly trained. We understand that everyone comes to the District with different levels of computer experience and a one-size fits-all training program won't work. It is essential that staff development resources are included in planning for technology to ensure that equipment is used effectively. The largest group requiring training will be teachers, who will require comprehensive in-service as the district sets new employment expectations.

· Continue to encourage the district to utilize outside training for staff by professional trainers in areas which adequate training cannot be offered within the district.

· Continue expansion of video and teleconferencing as a means to provide curriculum materials and staff development opportunities without the time lost for travel to other facilities.

Management Information Services will continue to focus on purchased support in the following areas:

- Consolidation of Help Desk services into a single point of contact.
- Repair and maintenance services as District master contracts.
- Contracted technical and programming services when service demand exceeds allocated long term staffing.
- Continue master contracts for printer toner supplies.

Estimated Cost:

2003: $2,500,000.00
2004: $2,700,000.00
2005: $2,900,000.00

Phase 5 - Determine Budget & Identify Funding Sources

5.3 Three Year Budget

Category	2003-2004	2004-2005	2005-2006	Category Totals
Workstations	$3,199,905.00	$4,366,260.00	$5,380,000.00	$12,946,165.00
Peripherals	$74,736.00	$99,697.00	$84,000.00	$258,433.00
Software	$1,150,757.00	$5,649,235.00	$3,395,000.00	$10,194,992.00
Supplies	$174,932.00	$165,126.00	$217,267.00	$557,325.00
Network	$296,000.00	$7,784,000.00	$9,000,000.00	$17,080,000.00
Infrastructure	$1,050,390.00	$2,200,920.00	$1,950,000.00	$5,201,310.00
Security-Equipment	$25,000.00	$130,000.00	$25,000.00	$180,000.00
Security-Information	$0.00	$0.00	$0.00	$0.00
Policies	$0.00	$0.00	$0.00	$0.00
Procedures	$0.00	$0.00	$0.00	$0.00
Maintenance	$0.00	$0.00	$0.00	$0.00
Upgrades	$0.00	$0.00	$0.00	$0.00
Additional Items	$0.00	$0.00	$0.00	$0.00
Professional Development	$135,720.00	$110,000.00	$110,000.00	$355,720.00
Technology-Related Staffing	$6,600,000.00	$6,930,000.00	$7,280,000.00	$20,810,000.00
End-User Support	$2,500,000.00	$2,700,000.00	$2,900,000.00	$8,100,000.00
Telecommunications	$0.00	$0.00	$0.00	$0.00
Budget Totals	$15,207,440.00	$30,135,238.00	$30,341,267.00	$75,683,945.00

Budget Process

Significant uncertainty about the District's future fiscal health existed at the time the plan was being developed. The values shown are staff perceptions of near term needed. The values shown are goals, the evolving fiscal reality is expected to reshape the actual values.

Years of ad hoc deployment and short range planning have created pockets of hardware and software technology which affect operational support requirements. The 1999-2000 computer lease standardized a large portion of the Instructional technology hardware but did not address curriculum software. Those computers are now 4 years old and aging. District adoption of planned replacement cycles is essential to avoid returning to a technology patch work environment.

The budget process in the future must recognize that the equity and the common good can not be maintained by a patchwork approach. Renewal and alignment of technology across 159 facilities and more than 70,000 users (staff and students) is not a casual or trivial process which can be accomplished in a single budget year.

5.4 Potential Funding Resources

Funding Source	2003-2004	2004-2005	2005-2006	Category Totals
General Fund (001)	$21,552,000.00	$21,552,000.00	$21,552,000.00	$64,656,000.00
Management Info Sys (025 & 432)	$638,489.00	$320,000.00	$320,000.00	$1,278,489.00
Network Connectivity Subsidy (451)	$2,434,023.00	$432,000.00	$432,000.00	$3,298,023.00
Power Up Capacity (457)	$68,943.00	$0.00	$0.00	$68,943.00
SchoolNet (450)	$954,720.00	$0.00	$1,000,000.00	$1,954,720.00
Schoolnet Prof Dev (452)	$4,690.00	$13,000.00	$13,000.00	$30,690.00

Telecommunity (453)	$102,878.00	$0.00	$0.00	$102,878.00
Universal Service /E-Rate (599-9469)	$981,551.00	$3,750,000.00	$3,750,000.00	$8,481,551.00
Funding Source Totals	$26,737,294.00	$26,067,000.00	$27,067,000.00	$79,871,294.00
Budget Totals	$15,207,440.00	$30,135,238.00	$30,341,267.00	$75,683,945.00

Proposed funding sources

Technology is funded through multiple sources. The District General fund provides support in the three primary budetary cost centers (0021,0030,0140).

The District will continue to seek assistance with its telecommunications costs through E-Rate (Universal Service Fund), Telecommunity grants and other ODE / Schoolnet allocations.

Phase 6 - Identify Monitoring, Evaluation & Revision Processes

6.1 Action Plan Monitoring Strategy

The needs of CPS will continually be monitored and assessed. The following guidlines provides a map that will be used to establish benchmark goals and monitor implementation of the Technology Plan:

1. Develop Columbus Public Schools Strategic Educational Plan
2. Develop a district professional development plan that addresses the key changes the district needs to make to achieve its educational vision and goals.
3. Review the district's performance-based curriculum to determine how to implement a technology scope and sequence framework to help teachers weave the district-adopted curriculum, student-centered learning practices, and technology into a rich learning environment for students.
4. Revise the district technology plan to provide greater focus and support for instructional technology, referencing the district strategic vision and goals.
5. Identify resources and support needed to carry out the district technology plan, including administrative leadership, instructional materials, professional development, and technology resources.
6. Revise the district technology plan to align with the new State Technology Academic Content Standards.

6.2 Plan Impact Evaluation

Assessing the Plan Impact

The District will convene panels to review progress on individual aspects of the plan.

The master plan will be maintained as a three year forward view. On completion of the first year of the plan the plan will be updated and a new third year projection added.

Evaluating the Outcomes and Impact of Technology Strategies

As a benchmark for developing a CPS K-12 Technology Curriculum, CPS will use the Ohio Technology Academic Content Standards and the International Education Technology Standards-Student Performance Indicators developed by ISTE. The district will use the ISTE Teacher and Administrator Standards to evaluate staff intergration of technology into student lessons and leadership efforts in technology.

See section 2.1 of this plan for specific student, teacher and administrator standards.

6.3 End-User Support Monitoring

Monitoring Technology Related Staff

Technology related support staff provide service to the user community through a service request ticket system.

During the course of this plan emphasis will be placed on monitoring performance data collected in the service request process. Changes in call volumes, types of calls, time to respond,and time to repair will be used as key indicators of the relationship between technology staffing and the support needs of the district.

Monitoring End-User Support Strategies

All Trainers attending Train-the-Trainer Workshops will fill out evaluation forms. These evaluations will be collected by the Instructional Technology Department and analyzed for Instructor and courseware effectiveness. Subsequent workshops will be revised and improved based on the responses from these evaluations.

This model of evaluation and improvement will extend to the Teacher Workshops in each district. The Instructional Technology Department will provide Trainers with an evaluation form to distribute at Teacher Workshops. The Instructional Technology Department will use these evaluations to provide Trainer support and get dynamic feedback from the Teacher workshop level of training. The Instructional Technology Department will then follow select teachers into their classrooms and observe the integration of technology at the delivery point of instruction. Adjustments and improvements will be made to the Train-the-Trainer and Teacher Workshops based on these observations and evaluations.

Beginning in the Fall semester of 2003, the Instructional Technology Department will distribute the Self-Evaluation of Computer Skills to their district's teachers at the beginning and the end of the semester. In subsequent year, this assessment will take place at the beginning and the end of the school year. The Instructional Technology Department will compile data from this assessment tool, conduct a statistical analysis, and compare the results of the control group (beginning of semester) and the end of semester data.

Monitoring Technology-Related Staff Development

The job of staff members is much more demanding today than it was ten years ago. Adults need time to experiment and to become comfortable with new job-related techniques and with supporting technology. Staff members need to be supported in this learning process. They need time to learn to use technology and how to manage the use of technology in the classroom.

Recommendations:

- Continue the Teacher Training Learning Series program with emphasis on the integration of technology into the curriculum.
- Create a Technology Professional Development Position with emphasis on training teachers on how to integrate technology into instruction and incorporating project-based learning methods.
- Ensure that technology training includes authentic tasks to demonstrate how to apply technology in education.
- Hold teacher learning days for curriculum integration of technology.
- Provide staff development training during in-service days.
- Provide incentives for teachers to integrate technology into the classroom.
- Provide additional support for integrating technology into the classroom.
- Utilize the staff development resources within the Central Ohio area.
- Establish a floating substitute to free staff during the school day to participate in technology professional development.
- Modify school schedules to allow minimum days on a regular basis to provide professional development time.
- Modify the role of the District Technology Director to focus more specifically on the instructional use of technology.
- Establish teacher competency standards for technology and use them to screen applicants and establish performance goals for staff.
- Establish more professional development opportunities through the use of compressed video and satellite.

6.4 Plan Update Process

This plan provides the District a roadmap for and technology staff development, K-12 technology curriculum development and curriculum integration. This three-year plan will focus on the District's direction for integrating technology into the curriculum, continued staff development and technology access for students and staff.

Technology is constantly changing, and these changes continue to influence every area of school and district functioning. Technology planning cannot be considered in isolation of other areas. A balance must always be maintained so that the needs of students, teachers, administration and the curriculum goals of the district are the driving forces behind the implementation of technology. In order to keep the plan a living process and continually updated, the major stakeholders (MIS, district, teachers, and parents) will collaborate to ensure that the plan is implemented and changed, when necessary.

6.5 Appendix

Date of board approved Acceptable Use Policy (AUP)

Jan 4 2000